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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,014	04/08/2004	Matthew S. Klee	10030994-1	8586

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AGILENT TECHNOLOGIES, INC.
Legal Department, DL 429
Intellectual Property Administration
P.O. Box 7599
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EXAMINER

BELLAMY, TAMIKO D

ART UNIT	PAPER NUMBER
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2856

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary

Application No.

10/820,014

Applicant(s)

KLEE ET AL.

Examiner

Tamiko D. Bellamy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/8/04.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-20 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/8/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 21. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **first surface having a third groove** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure

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must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **first plate with a first groove and third surface having a second groove** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. As disclosed in Fig. 6. The first and thirds plates (10, 20) are solid plates with no grooves. The second plate (20) has grooves in the on the first surface (22) of the second plate (20), and a groove on the second surface (27) of the second plate (20).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

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drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 5 is objected to because of the following informalities:
 - a. Claim 5, line 4, delete the words " with the first groove etched therein".
5. Claim 18 is objected to because of the following informalities:
 - a. Claim 18, line 6, change "a third surface that is bonded to a fourth surface" to - first surface that is bonded to the second surface--.Appropriate correction is required.
6. Claim 19 is objected to because of the following informalities:
 - a. Claim 19 line 1, change "1" to -18--.Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-4, 9-15, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaltenbach et al. (2001/008613).

Re claim 1, Kaltenbach et al. discloses in figs. 1, 3, and 5 a plurality of plates (146A, 146B) and at least one channel (148A) with an entrance and an exit. Kaltenbach et al. discloses in fig. 1, a temperature reducing module (e.g., peltier 120) in thermal contact with at least one plate (e.g., one side of separation unit 102).

Re claim 2, as depicted in fig. 5, Kaltenbach et al. discloses a first plate (146A) having a first groove (148A). Kaltenbach et al. discloses a second plate (146B) having a second surface, wherein the first and second surfaces are bonded together and the first groove (148A) forms the channel.

Re claim 3, as depicted in fig. 5, Kaltenbach et al. discloses a second surface having a second groove (148B) etched therein and the first and second grooves (148A, 148B) face each other forming a channel with the first and second surfaces bonded together.

Re claim 4, as depicted in fig. 5, Kaltenbach et al. discloses a first surface having a third groove etched therein and the second surface having a fourth groove etched therein wherein the third groove faces the fourth groove and forms a second channel when the surfaces are together.

Re claim 9, as depicted in fig. 1, Kaltenbach et al. discloses an electro-thermal device (e.g. peltier 120) in contact with one of the plates (e.g., separation unit 102) (Pg. 3, par. 31).

Re claim 10, Kaltenbach et al. discloses that other temperature control devices can be used to control the temperature such as cooling or heating by circulating air or liquid; this is equivalent to a thermal reducing module including an enclosed channel for conveying a cryogen in at least one of the plates (Pg. 4, par. 32).

Re claim 11, Kaltenbach et al. discloses in fig. 1, a thermal reducing module includes an enclosed channel for conveying a coolant in at least one of the plates (Pg. 3, par. 31).

Re claims 12 and 13, Kaltenbach et al. discloses in fig. 1, a heating module in thermal contact with at least one of the plates (e.g. separation unit 102) (Pg. 3, par. 31).

Re claim 14, as depicted in fig. 1, Kaltenbach et al. discloses the heating element (e.g., peltier 120) comprises an electrical conductive material integral with at least one of the plates (e.g., separation unit 102), and wherein electric current is applied through the plate (Pg. 3, par. 31).

Re claim 15, Kaltenbach et al. discloses that other temperature control devices can be used to control the temperature such as cooling or heating by circulating air or liquid; this is equivalent to vortex tube wherein the temperature is accomplished by the cold airstream of the vortex and the heating is accomplished by the hot airstream of the vortex (Pg. 4, par. 32).

Re claim 16, as depicted in fig. 6, Kaltenbach et al. discloses a middle plate (e.g. substrate 151B) having a first and second surface with material removed from the middle plate to form a continuous pathway (e.g., channel) with a beginning and end. Kaltenbach et al. also discloses two solid plates (151A, 151C) bonded to the middle plate (e.g.,

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substrate 151B). Kaltenbach et al. discloses a thermal reducing means in thermal contact with the at least one plate.

Re claim 18, as depicted in fig. 6, Kaltenbach et al. discloses a first plate (152A) having a first surface, a second plate (151B) having a second surface bonded to the first surface, and a third plate (151C) having a surface bonded to the surface of the second plate (151B). Kaltenbach et al. discloses that the second plate (e.g., substrate 151B) and the third plate (e.g., substrate 151C) have at least one groove (e.g., microchannel) formed therein (Pg. 3, par. 25). Kaltenbach et al. discloses a temperature modulator cooling at least one of the plates (e.g., separation unit) and a heating means.

Re claim 19, as depicted in fig. 6, Kaltenbach et al. discloses the second plate (e.g., substrate 151B) has one aperture (e.g., through hole 149) therethrough arranged to permit communication between the first and second channels forming one continuous channel (Pg. 3, par. 25).

9. Claims 1-4, 9-15, 18, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kaltenbach et al. (6,759,013).

Re claim 1, Kaltenbach et al. discloses in figs. 1, 3, and 5 a plurality of plates (146A, 146B) and at least one channel (148A) with an entrance and an exit. Kaltenbach et al. discloses in fig. 1, a temperature reducing module (e.g., peltier 120) in thermal contact with at least one plate (e.g., one side of separation unit 102).

Re claim 2, as depicted in fig. 5, Kaltenbach et al. discloses a first plate (146A) having a first groove (148A). Kaltenbach et al. discloses a second plate (146B) having a

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second surface, wherein the first and second surfaces are bonded together and the first groove (148A) forms the channel.

Re claim 3, as depicted in fig. 5, Kaltenbach et al. discloses a second surface having a second groove (148B) etched therein and the first and second grooves (148A, 148B) face each other forming a channel with the first and second surfaces bonded together.

Re claim 4, as depicted in fig. 5, Kaltenbach et al. discloses a first surface having a third groove etched therein and the second surface having a fourth groove etched therein wherein the third groove faces the fourth groove and forms a second channel when the surfaces are together.

Re claim 9, as depicted in fig. 1, Kaltenbach et al. discloses an electro-thermal device (e.g. peltier 120) in contact with one of the plates (e.g., separation unit 102) (Col. 6, lines 35-45).

Re claim 10, Kaltenbach et al. discloses that other temperature control devices can be used to control the temperature such cooling or heating by circulating as air or liquid; this is equivalent to a thermal reducing module including an enclosed channel for conveying a cryogen in at least one of the plates (Pg. 4, par. 32) (Col. 6, lines 54-58).

Re claim 11, Kaltenbach et al. discloses in fig. 1, a thermal reducing module including an enclosed channel for conveying a coolant in at least one of the plates (Col. 6, lines 35-45).

Re claims 12 and 13, Kaltenbach et al. discloses in fig. 1, a heating module in thermal contact with at least one of the plates (e.g. separation unit 102) (Col. 6, lines 35-45).

Re claim 14, as depicted in fig. 1, Kaltenbach et al. discloses a heating element (e.g., peltier 120) comprising an electrical conductive material integral with at least one of the plates (e.g., separation unit 102), and wherein electric current is applied through the plate (Col. 6, lines 35-45).

Re claim 15, Kaltenbach et al. discloses that other temperature control devices can be used to control the temperature such as cooling or heating by circulating air or liquid; this is equivalent to vortex tube wherein the temperature is accomplished by the cold airstream of the vortex and the heating is accomplished by the hot airstream of the vortex (Col. 6, lines 54-58).

Re claim 18, as depicted in fig. 6, Kaltenbach et al. discloses a first plate (152A) having a first surface, a second plate (151B) having a second surface bonded to the first surface, and a third plate (151C) having a surface bonded to the surface of the second plate (151B). Kaltenbach et al. discloses that the second plate (e.g., substrate 151B) and the third plate (e.g., substrate 151C) have at least one groove (e.g., microchannel) formed therein (Col. 5, lines 4-21). Kaltenbach et al. discloses a temperature modulator cooling at least one of the plates (e.g., separation unit) and a heating means.

Re claim 19, as depicted in fig. 6, Kaltenbach et al. discloses the second plate (e.g., substrate 151B) has one aperture (e.g., through hole 149) therethrough arranged to

permit communication between the first and second channels forming one continuous channel (Col. 5, lines 4-21).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 7 is are rejected under 35 U.S.C. 103(a) as being unpatentable over either Kaltenbach et al. (2001/008613) or Kaltenbach et al. (6,759,013) in view of Goedert (4,935,040).

Re claim 7, Kaltenbach et al. '613 or Kaltenbach et al. '040 discloses a channel (132). Neither Kaltenbach et al. '613 nor Kaltenbach et al. '040 discloses the channels containing a stationary phase. Goedert discloses a channel/column coated with a stationary phase (Col. 9, lines 25-60). Therefore, to modify Kaltenbach et al. '613 or '040 by employing channels containing a stationary phase would have been obvious to one of ordinary skill in the art at the time of the invention since Goedert teaches a detector having these design characteristics. The skilled artisan would be motivated to combine the teachings of Kaltenbach et al. '613 or Kaltenbach et al. '040 and Goedert since Kaltenbach et al. '613 or Kaltenbach et al. '040 states that his invention is applicable to a microchannel apparatus used for gas analysis and Goedert is directed to gas analyzer.

12. Claims 6-8, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over either

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Kaltenbach et al. (2001/008613) or Kaltenbach et al. (6,759,013) in view of Hobbs et al.

(2002/0187557).

Re claims 6 and 20, Kaltenbach et al. '613 or Kaltenbach et al. '040 discloses a channel (132). Neither Kaltenbach et al. '613 nor Kaltenbach et al. '040 disclose coating the channels with an inert substance. Hobbs et al. discloses a channels/columns coated with an inert substance (e.g., silica gel) (Pg. 6, par. 75). Therefore, to modify Kaltenbach et al. '613 or Kaltenbach et al. '040 by employing channels coated with an inert substance would have been obvious to one of ordinary skill in the art at the time of the invention since Hobbs et al. teaches a microfluidic device having these design characteristics. The skilled artisan would be motivated to combine the teachings of Kaltenbach et al. '613 or Kaltenbach et al. '040 and Hobbs et al. since Kaltenbach et al. '613 or Kaltenbach et al. '040 states that his invention is applicable to a microchannel apparatus used for gas analysis and Hobbs et al. is directed to a microfluidic device used in chromatography.

Re claim 7, Kaltenbach et al. '613 or Kaltenbach et al. '040 discloses a channel (132). Neither Kaltenbach et al. '613 nor Kaltenbach et al. '040 discloses channels containing a stationary phase substance. Hobbs et al. discloses a channels/columns coated with a stationary phase substance (138-140) (Pg. 6, par. 75). Therefore, to modify Kaltenbach et al. '613 or Kaltenbach et al. '040 by employing channels containing a stationary phase substance would have been obvious to one of ordinary skill in the art at the time of the invention since Hobbs et al. teaches a microfluidic device having these design characteristics. The skilled artisan would be motivated to combine the teachings of Kaltenbach et al. '613 or Kaltenbach et al. '040 and Hobbs et al. since Kaltenbach et

al. '613 or Kaltenbach et al. '040 states that his invention is applicable to a microchannel apparatus used for gas analysis and Hobbs et al. is directed to a microfluidic device used in chromatography.

Re claim 8, Kaltenbach et al. '613 or Kaltenbach et al. '040 discloses a channel (132). Neither Kaltenbach et al. '613 nor Kaltenbach et al. '040 discloses channels coated with an inert substance and contains one of a liquid stationary phase substance and a liquid stationary phase substance. Hobbs et al. discloses a channels/columns coated with a stationary phase substance (138-140) coated with an inert substance (e.g., silica gel) (Pg. 6, par. 75). Therefore, to modify Kaltenbach et al. '613 or Kaltenbach et al. '040 by employing channels containing a stationary phase substance would have been obvious to one of ordinary skill in the art at the time of the invention since Hobbs et al. teaches a microfluidic device having these design characteristics. The skilled artisan would be motivated to combine the teachings of Kaltenbach et al. '613 or Kaltenbach et al. '040 and Hobbs et al. since Kaltenbach et al. '613 or Kaltenbach et al. '040 states that his invention is applicable to a microchannel apparatus used for gas analysis and Hobbs et al. is directed to a microfluidic device used in chromatography.

13. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Craig (5,997,708) in view of Kaltenbach et al. (2001/008613) or Kaltenbach et al. (6,759,013).

Re claim 16, as depicted in fig. 6A, Craig discloses a middle plate (e.g., second portion 288B) with a first and second surface and with material removed from the middle plate (e.g.,

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second portion 388B) to form a continuous pathway (e.g., channel 260') with a beginning and end. Craig discloses two substantially solid endplates (e.g., first portion (288A) and third portion (288C) bonded to the middle plate (e.g. second portion 288B). Craig does not specifically disclose a temperature reducing means. Kaltenbach et al. (2001/008613) or Kaltenbach et al. (6,759,013) disclose in fig. 1, a temperature reducing means (e.g. peltier 120). Therefore, to modify Craig by employing temperature reducing means would have been obvious to one of ordinary skill in the art at the time of the invention since Kaltenbach et al. (2001/008613) or Kaltenbach et al. teaches a microchannel apparatus having these design characteristics. The skilled artisan would be motivated to combine the teachings of Craig and Kaltenbach et al. (2001/008613) or Kaltenbach et al. since Craig states that his invention is applicable to microstructures including channels used in systems such as analysis instrumentation in gas/liquid chromatography systems and Kaltenbach et al. (2001/008613) or Kaltenbach et al. is directed to microchannel apparatus used for gas analysis.

Re claim 17, Craig discloses in fig. 6A, a middle plate (e.g. second portion 288B) with a pathway (e.g. channel 260') having a beginning and an end. While Craig does not specifically suggest the beginning of the pathway is in the center of the middle plate and the end of the pathway is at the outer edge, Craig specifically states (See Col. 16, lines 30-31) that the pathway/channel can be provided in a wide variety of geometries. This teaching clearly infers and/or suggests the pathway having a beginning in the center of the middle and ending in at an outer edge. Therefore, Therefore, to employ Craig on a the beginning of the pathway is in the center of the middle plate and the end of the pathway is at the outer edge on would have been obvious to one of ordinary skill in the art at the time of the invention since this reference

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explicitly teaches its use on microstructures including channels used in systems such as analysis instrumentation in gas/liquid chromatography systems.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (571) 272-2190. The examiner can normally be reached on Monday - Friday 7:30 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tamiko Bellamy

T.B.

April 7, 2005